STAFF CROSS 3

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Staff Cross 3

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Revised 1-92

FORWARD

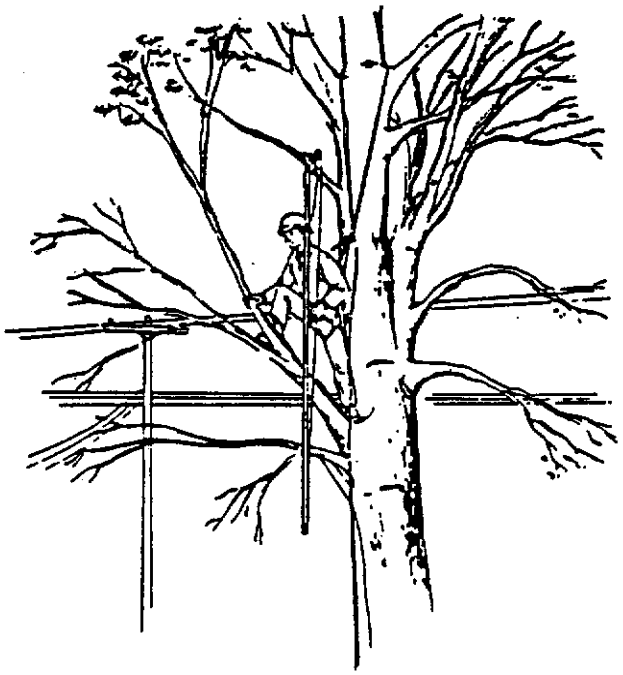
From a customer relations standpoint, few actions we take as a company can affect our relationship more than tree trimming.

Because the results of our actions are so visible, and because customers can be quite emotional about their trees, extreme care must be taken at all times to follow approved and appropriate tree trimming procedures.

The need for good communication between the Company and property owners when trimming trees is essential. Just one incident can create hard feelings and make it difficult for the Company to improve its overall image with customers.

The purpose of this manual is to provide the supervisors, employees and contractors of the Central Illinois Light Company with a set of uniform procedures that couple safety and efficiency with arboriculturally approved practices.

Tree trimming is a complex activity that is essential to the continuity of electric service to our customers. Practicality prohibits the detailed discussion of every work procedure, however, all the basics have been included and this manual will be considered the standard by which all line clearance activities are performed throughout the Company.



SECTION I
REGULATIONS GOVERNING LINE CLEARANCE ACTIVITIES

Prior to the construction of overhead electric facilities, it is standard practice to obtain from owners of record the necessary rights to properly maintain those facilities to ensure continuity of service. These rights are acquired in the form of easements from private property owners, permits from township, county, and state and federal highway authorities, and licenses from railroads and similar entities. In general, these rights include the right to trim and remove trees threatening the safe and uninterrupted operation of the facilities as well as the right of ingress and egress to ensure access to the affected properties. The Company acquired rights, even though legally binding, should not be viewed as dominant and should be exercised only through full communication with the owners involved. The following guidelines and instructions should be used to protect the delicate balance between the Company and property owner's rights.

1. Property Rights

1.1 Private Property

For the purpose of securing line clearance, private property is defined as all land owned by an individual or a company and the trees and shrubs growing on them. In general, lands back of highway rights-of-way and twelve inches or more back of sidewalks in urban areas are privately owned. Land ownership extends up as well as down from the exact property line. This means that tree crown growth extending beyond the property line may be legally controlled by the adjacent owner of such land.

1.2 Public Land

Highways and streets dedicated for the purpose of public travel only are conveyed by the adjacent property owners as easements with all other rights being retained by these property owners. In these cases the legal description on deeds normally extends to the center of the thoroughfare and taxes continue to be paid by the owner of record. This is true predominantly in rural areas along township and many county roads. In these situations the adjacent property owners have a legal right to the land and the products of the soil including trees, shrubs, and farm crops provided they do not hinder its use for highway purposes.

Most new limited access highways and other state and county highways being built today are on lands purchased in total from private owners. As a rule, the state and counties completely control these fully owned rights-of-way and regulate any requests for encroachment by either public utilities or private parties. Within cities, villages and subdivisions, lands set aside for public streets rarely appear in the legal deeds of abutting owners; therefore, such owners may not in general possess full rights to

trees planted or growing upon such public thoroughfares. Dedicated easements for utilities along side lots and rear lots of subdivisions are still owned by the property owner of record and can still be used for any purpose not restricted by the dedication.

Caution should be exercised when performing line clearance activities where utility lines are constructed in close proximity to the right-of-way boundary. In most instances additional easement rights were not secured to provide for the clearance necessary to ensure safe, reliable service. In these situations it is essential that adjacent property owners be notified of the intent to trim or that written permission be secured from them before work begins even if a permit has been obtained from a government agency.

2. Notification of Intent to Trim or Remove

2.1 Public Property - Permits

Unless specifically indicated, securing written permission to perform line clearance activities on public rights-of-way from public authorities is the responsibility of CILCO management personnel. This includes, but is not limited to, federal, state, county, township, and city property. If, in the course of performing routine activities, it is determined that work will involve public land, the crew leader should contact the supervisor in charge prior to commencement of any work.

2.2 Private Property - Contact with Owners

Routine contact with property owners (customers) is the responsibility of the crew leader.

The primary objective of using the notification of intent to trim procedure is to provide improved system reliability in the most economical manner. This is accomplished by the systematic trimming or removal of all vegetation on a circuit which could threaten the continuity of service during the established trim cycle.

The success of our program is dependent on the skill of crew leaders and supervisors in communicating to the property owner that the proposed actions are in his best interest.

Communication with the customer should stress the benefits of healthier regrowth of trees, more reliable service, and reduced operating costs. A professional approach, emphasizing courtesy and sincerity, should be used to keep the relationship with the customer as friendly and positive as possible. In situations where it is evident that a friendly, positive contact is not possible, the crew leader should politely excuse himself and indicate that another CILCO representative will contact the customer.

Under no circumstances should the crew leader proceed to trim less than the standard clearance established in Section IV of this manual without authorization to do so by his supervisor.

2.3 Notification of Intent to Trim

Prior to trimming on private property, the crew leader will attempt to verbally notify the owner of the intended activities. If the property owner is not at home, the green door-hanger (Fig. I-1) will be placed on a door where it is likely to be seen. The box showing the intended trimming style should be marked on the card.

Door-hangers should be left on the door for a period of at least two days to allow the owner the opportunity to respond to our notification. Upon returning to the skipped location an attempt to contact the owner verbally should be made. If no one is home, no further effort to contact the owner is required and the work should be completed as necessary. However, if the owner returns during the course of trimming on his property, an attempt should be made to answer any questions or explain the necessity of the work in a pleasant and helpful manner.

(Fig. I-1)

SORRY WE MISSED YOU

The tree branches on this property have grown to the point where they are likely to interfere with electric service to you and your neighbors.

As part of our routine line clearance program, a CILCO crew or one of our contractors will be trimming trees in your neighborhood within the next 1 to 7 working days.

All trimming will be done free of charge and completed in a professional *manner utilizing* approved arborist methods. The type(s) of trimming needed on this property will resemble the example(s) marked below. Our crews will clean the area of brush. Where heavier trimming is necessary, larger wood will be cut into manageable lengths and left at the base of tree for your use.

No response is necessary, but if you would like to discuss this further, please call us between 7:30 a.m. and 4:30 p.m. on weekdays.

CILCO A CILCORP COMPANY

Central Illinois Light Company

PEORIA FORESTRY_____ 693-4623

_____ DATE _____ CREW LEADER

(Fig. I-2)

WHILE YOU WERE AWAY

We were here today to talk to you about the tree(s) on this property: _____

CILCO forestry crews routinely trim limbs and branches to *help protect you and your neighbors from* electric outages. Occasionally, due to a tree's size, location and/or condition, it is more practical to remove it than trim it.

Therefore, we would like your permission to proceed with the removal of: species_____

location_____

_____

This work will be done at no cost to you. Our crews will clean the area of brush, cut larger wood into manageable lengths and stack it for your use.

As owner, I agree with this proposal

Signature _____ Phone _____

The owner of this property is:

Name _____ Phone _____

If you wish to discuss this further, please call us between 7:30 a.m. and 4:30 p.m. on weekdays.

PEORIA FORESTRY____ 693-4623

Please fill out and mail promptly so we can schedule this work.

CILCO A CILCORP COMPANY

Central Illinois Light Company

_____ Date _____ Crew Leader

In emergency and customer request (hot spot) situations, it is not necessary to leave a door-hanger. Work will proceed as necessary.

2.4 Removal Permission

Prior to the removal of any tree on private property, a yellow permission card (Fig. I-2) must be completed by the crew leader and signed by the property owner. Upon completion of the removal, the card will be dated, signed, and returned by the crew leader to the supervisor to be retained and filed for future reference.

In the event the owner is not at home and the condition or location of the tree warrants it removal, a completed card should be left on the door for return by the owner. If within a reasonable time - 3 to 5 days - the owner has not responded to the removal card, the crew should return, attempt a contact with the owner, and if still unsuccessful, trim to the specified clearance standard.

If in the judgment of the crew leader, the tree in question is in imminent danger of falling on Company facilities and permission cannot be obtained for its removal, the crew leader should refer the information to the supervisor for disposition.

2.5 Trimming Objections

The following steps are to be taken when a property owner objects to allow necessary tree trimming.

A. The tree crew leader or contract crew foreman will advise the property owner that the proposed trimming must be done to ensure public safety and continuity of electric service. The property owner shall be informed that approved line clearance trimming methods will be utilized. Courtesy, tact, and good judgment are to be used at all times.

B. If the above fails, the tree crew leader or contract crew foreman will contact the supervisor in charge and provide all information in regard to the property owner's objection to the necessary trimming. The supervisor will then meet with the property owner in an attempt to resolve the property owner's objection. Again, courtesy, tact, and good judgment is expected throughout the discussion. MAKE A RECORD OF ALL CONVERSATION OR OTHER COMMUNICATIONS.

C. If the above attempt fails, the supervisor will contact the general supervisor for assistance. The general supervisor may elect to contact the property owner in an attempt to resolve the situation, or refer the matter to Risk Management.

D. Risk Management will advise the property owner by mail of our obligation as a public utility to provide for public safety and electric service reliability. This letter will include:

* Information from ICC General Order #172 that notes our responsibilities in this area of concern.

* A copy of the easement, plat, franchise agreement or other instrument granting CILCO the right to trim.

* The necessity of trimming at the location involved.

* The set time and date planned for the trimming operation.

* The person to contact and the telephone number to call for further discussion of the issue.

E. The tree or trees involved will then be trimmed at the designated time and date unless:

1. A threat of bodily harm is encountered or;

2. Legal action is taken by the property owner - (i.e. restraining order served by police or other law enforcement personnel)

If either of the above circumstances develop, the tree crew leader or contract crew foreman will immediately leave the area without further discussion or argument with the property owner, and notify the supervisor in charge. Further legal action will be taken as necessary to protect the public and maintain electric service.

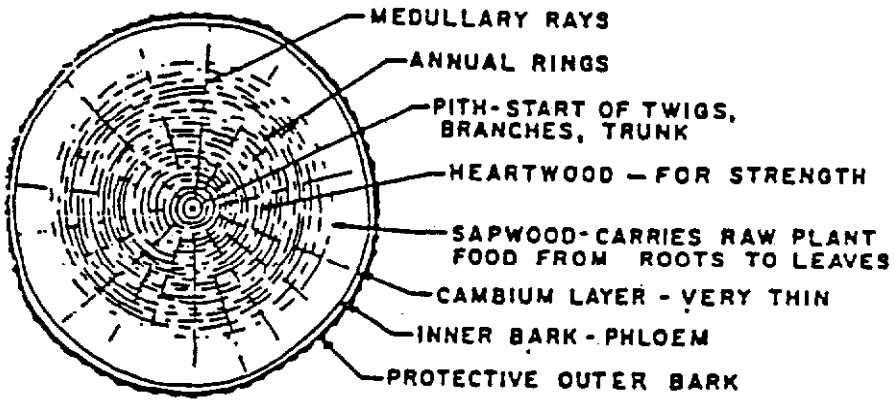
SECTION II
CHARACTERISTICS OF TREES

This Section deals with trees as living, growing things in the plant world. It is very essential for those working with trees to know a good deal about how and where they grow, wood structure, the function of various parts, and the characteristics of various species and subspecies.

1. Principal Tree Parts

In simple terms, a tree is described as a perennial woody plant, with a single self-supporting stem, reaching a height of 10 feet and over. In its entirety a tree is composed of live tissue made up of many tiny cells, varying in size, shape and function.

(Fig. II-1)



TREE STEM CROSS-SECTION

1.1 Bark

1.11 Outer covering consists largely of dead cells.

1.12 Protects from injury, inner live cell tissue.

1.13 Pressure from growing inner tissue causes bark to develop ridges and fissures, also scales, which gradually loosen and slough off in most tree species.

1.2 Phloem

1.21 Inner layer of bark.

1.22 Conducts ready-to-use plant nutrients from leaves to all other parts.

1.3 Cambium

1.31 A vital layer, only a few living cells in thickness, just under the inner bark.

1.32 Forms bark on the outside and new wood on inside of layer.

1.33 Destruction of the cambium by stem girdling or other means usually kills tree above point of such injury.

1.4 Sapwood

1.41 A thick whitish layer just under the cambium.

1.42 Carries raw plant nutrients, known as sap, from roots to leaves.

1.43 Stores plant food and provides tree structure and strength.

1.5 Heartwood

1.51 The center section of a tree.

1.52 Usually dark colored and heavy textured.

1.53 Consists wholly of dead cells.

1.54 Major function is to store wood which provides mechanical strength to tree structures.

1.6 Leaves

1.61 Consists of special cells containing chlorophyll (green color of leaves).

1.62 Major function is to change raw mineral elements into usable plant nutrients.

1.63 Requires sunlight acting on chlorophyll, in presence of mineral elements in solution, to manufacture plant food.

1.64 In manufacturing process, uses carbon dioxide while releasing water and oxygen into atmosphere.

1.7 Crown

1.71 Consists of entire upper tree structure beginning with lowest side branches.

1.72 Provides tree balance, symmetry, and beauty.

1.8 Trunk

1.81 Center stem of tree, carrying side limbs and branches.

1.9 Roots

1.91 Underground portion of tree.

1.92 Anchors tree to earth in upright position.

1.93 Root system often has horizontal spread equal or greater than width of tree crown.

1.94 Absorbs water and mineral from soil translocating same to trunk, crown, and leaves.

2. Tree Identification

The ability to readily identify a majority of shade and forest trees growing in the Company's service area makes daily work easier and safer for line clearance supervisors, crew leaders, and workmen. The many tree species and subspecies common in the area present a wide range of wood strengths, crown structures and growth rates, as well as tree work required for line clearance. By knowing the tree species at hand, and making allowance for good and bad characteristics, trimmers can obtain personal satisfaction and secure effective, economical line clearance. Space available in this manual does not permit inclusion of the large amount of detail required for scientific tree identification. For average field needs, the individual tree may be identified by one or more of the following features:

2.1 Leaves: by shape, border, markings, color, and how attached to supporting twigs.

2.2 Bark: by color, fissures, degree of toughness, and with a few species, taste.

2.3 Buds: by color, shape, size, and arrangement on twigs.

2.4 Wood: by color, grain, general appearance, and strength.

2.5 Crown Structure: by twig color, limb arrangement and size, also crown outline shape.

3. Growth and Strength Characteristics

Table II-1 is an alphabetical listing of the more common trees in the service area of this Company. It provides, for easy reference, important tree factors including form, average annual growth rate, approximate mature height, rupture strength of green wood and other characteristics to guide engineers, supervisors, foremen, and workmen engaged in line clearance planning and programs.

Apply these listed values with good judgment, constantly mindful that trees vary greatly, depending upon species, site, soil and local environment.

TABLE II-1

GROWTH AND STRENGTH CHARACTERISTICS OF COMMON TREES

Species (Common Name)	(1) Crown Growth Shape	(2) Approx. Average Annual Terminal Growth in Feet**	(3) Approx. Mature Height in Feet	(4) Wood Strength Rupture (Green)	(5) Type of Trimming Most Suitable and Features of Wood
Ailanthus*** (Tree of Heaven)	"S"	1 1/2 - 2 1/2	40 - 50	3,500*	Very brittle and brashy.
Ash (White)	"U"	2 - 3	65 - 80	9,300	Strong wood but has tendency to split. Will not stand heavy topping.
Ash (Black)	"U"	1 1/2 - 2	60 - 70	6,000	Medium strong wood.
Apple (Varieties)	"S"	1	20- 25	7,400	Relatively strong wood. Top only if required.
Basswood	"S"	1 1/2 - 2	60 - 75	5,000	Soft wood, splits easily. Top or side trim.
Beech	"S"	1 - 2	55 - 60	8,600	Fairly strong. Difficult to side trim.
Birch	"S"	2 - 2 1/2	45 - 50	6,400	Weak structurally. Avoid trimming if possible; intolerant to topping.
Box Elder***	"H"	2 - 3	45 - 50	5,700*	Weak, brittle wood; suckers vigorously.
Buckeye (Horsechestnut)	"S"	1 - 1 1/2	50 - 60	4,800	Soft wood, weak; slow-growing. Top or side trim.
Catalpa***	"S"	1 - 1 1/2	45 - 60	5,200	Soft, weak wood; slow-growing. May be topped, side or undertrimmed.
Cherry*** (Black)	"S"	2 - 3	50 - 60	8,000	Fairly strong; bark of branches splits easily. Top moderately or side trim.
Cottonwood*** (Carolina Poplar)	"U"	4 - 4 1/2	80 - 90	5,300	Very brittle; breaks abruptly. Top, side or undertrim.
Dogwood (Flowering)	"S"	6" - 1'	20 - 25	8,800	Strong wood. Should be overbuilt.
Elm (American)	"U"	3 - 4	75 - 90	7,200	Strong flexible wood; top moderately or undertrim.
Elm*** (Chinese)	"U"	3 1/2 - 4 1/2	60 - 65	5,200*	Rather brittle. Top or side trim.
Ginko	"U"	1 - 1 1/2	40 - 45	5,500*	Fairly strong wood. Top or side trim moderately.
Hackberry***	"S"	2 - 3	45 - 50	6,500	Strong wood. Top or side trim.

Species (Common Name)	(1) Crown Growth Shape	(2) Approx. Average Annual Terminal Growth in Feet**	(3) Approx. Mature Height in Feet	(4) Wood Strength Rupture (Green)	(5) Type of Trimming Most Suitable and Features of Wood
Hawthorn (Varieties)	"H"	1 - 1 1/2	20 - 30	11,000*	Strong wood. Should be overbuilt.
Hickory (Varieties)	"U"	1 - 2	60 - 65	10,500*	Wood strong, and tough. Side or undertrim.
Locust*** (Black)	"S"	2 - 3	50 - 60	13,800	Hard strong wood, but crotches weak. Top or side trim.
Locust (Honey)	"U"	1 1/2 - 2	65 - 80	10,200	Very strong and tough; crotches strong. Thorns. Top or side trim.
Maple (Norway)	"H"	1 - 2	45 - 50	9,400	Strong wood. Top or side trim moderately. Should be overbuilt.
Maple (Red)	"S"	1 1/2 - 2	45 - 50	7,700	Medium strong. Top or side trim.
Maple (Silver)	"U"	3 - 4	70 - 75	5,800	Structurally weak. Wood brittle. Top or side trim.
Maple (Sugar)	"S"	1 - 1 1/2	65 - 75	9,400	Strong wood. Avoid heavy topping and deep side trimming.
Oak (Pin)	"U"	2 - 2 1/2	60 - 75	8,300	Strong wood. Side trim moderately.
Oak (Red)	"S"	2 - 3	75 - 85	6,900	Very sturdy structure. Side or undertrim.
Oak (White)	"S"	1 - 2	65 - 75	8,300	Very sturdy. Avoid heavy topping.
Osage Orange	"H"	1 - 1 1/2	40 - 45	13,700	Very strong and flexible. Thorns.
Pear	"U"	1 - 2	35 - 40	6,500*	Strong wood, splits easily. Top or side trim.
Persimmon	"U"	1 - 2	25 - 30	17,700	Strong wood. Top or side trim.
Poplar*** (Lombardy)	"U"	4 - 5	50 - 60	4,000*	Soft brashy wood Top or side trim.
Poplar*** (White)	"S"	1 1/2 - 2	45 - 50	6,100*	Fairly strong wood. Top or side trim. Avoid overhang.
Sycamore (American)	"U"	2 - 3	80 - 90	6,500	Very strong, twisted gran; suckers vigorously. Side or undertrim.
Sycamore (Oriental)	"S"	1 1/2 - 2	50 - 60	6,500	Very sturdy. Top, side or undertrim.

Species (Common Name)	(1) Crown Growth Shape	(2) Approx. Average Annual Terminal Growth in Feet**	(3) Approx. Mature Height in Feet	(4) Wood Strength Rupture (Green)	(5) Type of Trimming Most Suitable and Features of Wood
Tulip Tree*** (Yellow Poplar)	"U"	2 1/2 - 3	80 - 100	5,400	Fairly strong wood. Top or side trim.
Walnut (Black)	"S"	1 - 1 1/2	65 - 80	9,500	Strong wood. Avoid heavy topping; side trim moderately.
Willow*** (Varieties)	"H"	3 - 4	45 - 50	3,800	Very brittle. Top or side trim.

Note: Conifers (evergreens) are not listed above as such tree species are only infrequently encountered on public rights-of-way.

* Estimated figure
** These values are based on semi-mature trees
*** Indicates species desirable to remove.

"U" - Upright form
"S" - Spreading form
"H" - Horizontal form

3.1 Tree Shape

Each shade tree species has a natural tendency to grow a develop a characteristic form. Vertical Column (1) of Table II sets forth the tree major form types - namely upright, spreadin and horizontal - abbreviated as "U", "S", and "H".

A good working knowledge of individual tree species' natural fo type habits is essential to sound tree clearance planning a programming.

3.2 Average Growth Rate

Column (2) shows values of annual growth rates based on th average semi-mature tree under ordinary growing conditions.

3.21 During the natural development of a tree, growth is mor rapid during the early years.

3.22 Average annual growth rate generally becomes less year by year after one-half mature size has been reached.

3.3 Approximate Mature Height

Column (3) values indicate the normal ultimate height to be expected of an individual tree in each species.

Some variation in normal development results from local environment of soil, moisture, and available space for crown spread.

3.4 Wood Strength (Rupture Green)

Column (4) lists relative strength of different sound green woods, measured across the fiber.

3.41 These values do not allow for concealed and other tree limb and trunk defects, such as weak "V" crotches, that the tree worker must deal with.

3.42 These values should be used as a guide only, implementing but not replacing on-the-job knowledge.

3.5 Type of Trimming Most Suitable

Notes under the last vertical column (5) are for reference by tree trimming forces; also by field men in laying out overhead transmission and primary lines.

4. Induced Growth Rate

Greater than normal tree growth rate results from heading back or shortening a healthy live limb.

4.1 Growth is stimulated by an unbalanced condition between crown and root quantities caused by the cutting operation.

4.2 Induced growth of a tree with average vitality is invariably in excess of what would occur if the tree is permitted to develop normally.

4.3 It is greater in the first year after trimming than in successive years.

4.4 The first year induced growth is approximately three times the normal rate.

4.5 Generally, the heavier the trimming, particularly with topping, the greater the resurgent induced growth.

5. Wood Weight

5.1 To determine loading and capacity of equipment required, not Table II-2 for green timber weight.

TABLE II-2

WEIGHT TABLE FOR GREEN LOGS (Approximate)

TO USE: Multiply length of log in feet by the weight of a one-foot section, using the mean diameter of the log.

Species	Weight per cu. ft. lbs.	Weight of one-foot sections — based on mean diameters. 10" lbs.	12" lbs.	14" lbs.	16" lbs.	18" lbs.	20" lbs.	22" lbs.	24" lbs.	26" lbs.	28" lbs.	30" lbs.	32" lbs.	34" lbs.	36" lbs.
Ailanthus	38	21	30	40	53	67	83	99	119	149	162	186	211	239	268
Apple	55	30	43	59	77	97	120	145	173	203	235	270	307	347	385
Ash, White	48	26	38	51	67	85	104	126	150	177	205	235	267	302	335
Basswood	42	23	33	45	59	74	92	111	132	155	180	206	235	265	297
Beech	54	29	42	58	75	95	118	142	169	199	231	265	301	340	381
Birch, Yellow	57	31	45	61	80	101	124	151	179	210	244	280	319	360	403
Box Elder	47	25	37	50	66	83	102	123	148	174	199	234	262	296	331
Buckeye	49	26	38	52	69	86	107	129	154	182	207	245	273	309	345
Butternut	46	25	36	49	64	81	100	121	144	170	197	226	257	290	325
Catalpa	34	19	27	36	47	60	74	90	106	125	145	166	189	214	239
Cherry, Black	45	25	35	48	63	79	98	119	141	166	192	221	251	283	318
Cottonwood	49	27	38	52	68	86	107	129	154	180	209	240	273	310	346
Elm, American	54	29	42	58	75	95	118	142	169	199	231	265	301	340	381
Elm, Chinese	49	26	38	52	69	86	107	129	154	182	207	245	273	309	325
Hackberry	50	27	39	53	70	88	109	132	157	184	214	245	279	317	354
Hawthorn	48	26	38	51	67	85	104	26	150	177	205	235	267	302	338
Hickory, Shagbark	64	35	50	68	89	113	140	169	201	236	273	314	357	403	452
Honey Locust	61	33	48	65	85	108	133	161	192	225	261	299	341	385	431
Ky. Coffee Tree	44	24	34	47	62	77	96	116	138	163	186	220	246	277	310
Maple, Norway	54	29	42	58	75	95	118	142	169	199	231	265	301	340	381
Maple, Red	50	27	39	53	70	88	109	132	157	184	214	245	279	317	353
Maple, Silver	45	24	35	48	63	79	98	119	141	166	192	221	251	283	318
Maple, Sugar	56	31	44	60	78	99	122	148	176	206	239	275	313	353	396
Oak, Black	62	34	48	66	86	109	135	163	194	228	265	304	346	390	437
Oak, Live	76	41	60	81	106	134	166	200	238	280	324	372	424	478	536
Oak, Red	63	34	49	67	88	111	137	166	198	232	269	309	351	397	445
Oak, White	62	34	48	66	88	109	135	163	194	228	265	304	346	490	437
Osage, Orange	62	34	48	66	88	109	135	163	194	228	265	304	346	490	437
Pear	58	32	45	62	81	102	126	153	182	213	245	284	323	364	409
Poplar, Yellow	38	21	30	40	53	67	83	99	119	140	162	186	211	239	268
Sycamore	52	28	41	55	72	92	113	137	163	191	222	254	290	327	366
Walnut, Black	58	32	45	62	81	102	126	153	182	213	248	284	323	364	409
Willow, Black	51	28	40	55	71	90	111	134	160	189	216	254	285	321	360
Pine, N. White	36	20	28	38	50	64	78	95	113	133	154	176	201	227	254
Spruce, Red	34	19	27	36	47	60	74	90	106	125	145	166	189	214	239

SECTION III
METHODS

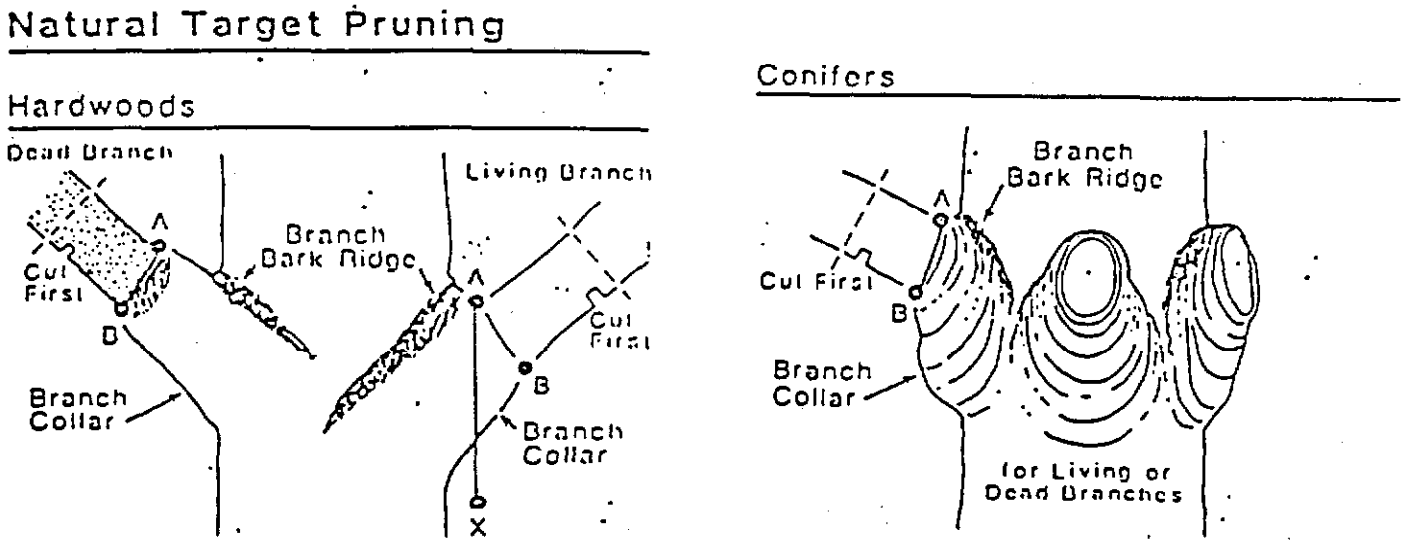
This section deals with the mechanical and arboricultural aspects of tree work. Use of the best known procedure makes work easier and more effective. Various trimming methods are described on the following pages.

1. Tree Trimming

Both initial trimming and retrimming shall be done in accordance with established, sound principles of arboriculture. Work shall be done to provide balanced emphasis on clearance for power lines, current tree welfare and symmetry. A minimum of 3 years safe line operating clearance from regrowth should be obtained for primary and transmission conductors.

1.1 Standard Cuts (Fig. III-1)

1.11 Pruner cuts shall be made beyond the branch collar of the limb being removed to prevent potential "peeling down" damage.



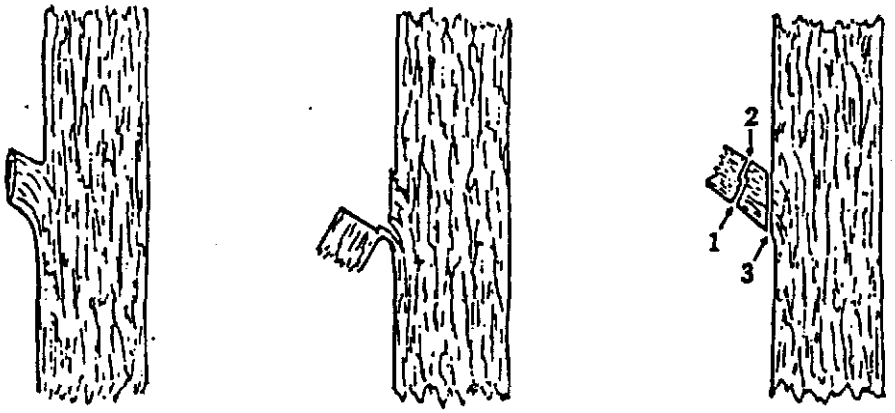
(Fig. III-1)

1.12 Final saw cuts should be made at the outer edge of the branch collar (line A-B) leaving the bark branch ridge intact.

(a) Proper cuts aid rapid healing of tree wounds.
(b) Stubs permit damaging decay to enter trees.

1.13 Heavy limbs shall be stubbed off or their weight supported before the final cut is made.

(Fig. III-2)



wrong wrong right

This practice avoids bark tearing and wood splintering back of the final cut.

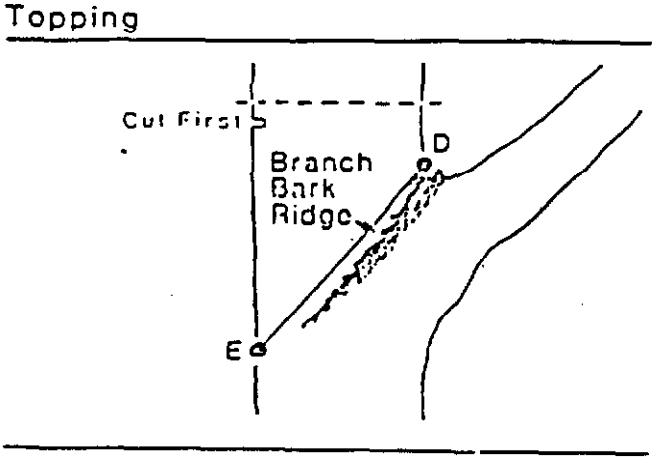
1.14 When only a part of a limb is to be removed, the part removed shall be cut back flush to a side branch at least 1/3 the diameter of the portion removed.

1.15 To avoid a girdling effect, a series of large adjacent cuts should not be made around a tree trunk or a major limb.

1.2 Oblique Cuts (Fig. III-3)

Oblique cuts are intended for cutting off upright limbs. Before making this cut the upright limb should be undercut through the bark at the base of the oblique cut to prevent peeling. Make an oblique cut on the vertical limb at an angle of 45 degrees just above a side limb. The angle permits water to run off and lessens the possibility of decay.

(Fig. III-3)



1.3 Safety Requirement for Tree Care Operations

All line clearance personnel should familiarize themselves with t American National Standards Institute publication ANSI Z133. entitled American National Standard for Tree Care Operations This publication provides a general standard for safet requirements in tree care operations and is intended to amplif and supplement CILCO's Safe Practice Manual. Any questio regarding safe operations should be addressed to your supervisc for clarification. See Appendix A.

2. Tree Shaping

2.1 Shade Trees

2.11 Trim for line clearance in a manner to retain natural shap and symmetry as much as possible.

(a) This principal shall be regularly applied to top, sid and under trimming unless the property owner direct otherwise.
(b) In through trimming, this principal shall be applied s as to direct future growth away from conductors.

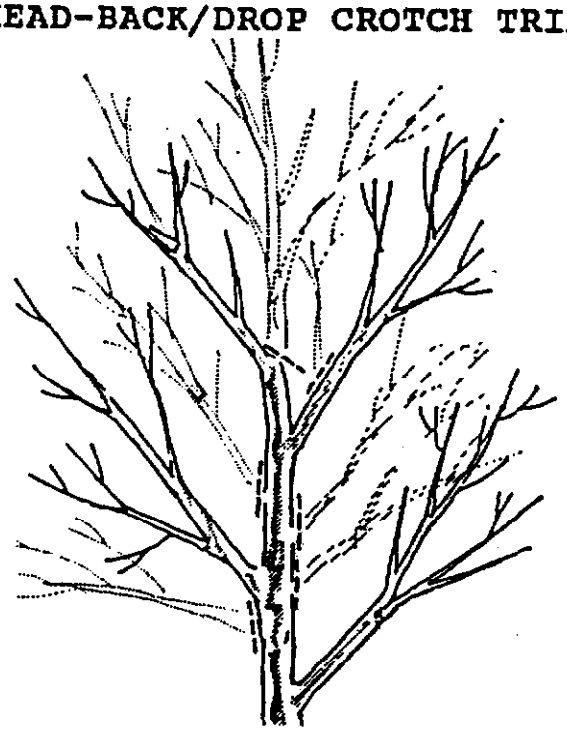
2.2 Natural Shape

2.21 In topping, large upright limbs should be cut back to a suitable side branch well below the intended finished uppe crown. (Figure III-4)

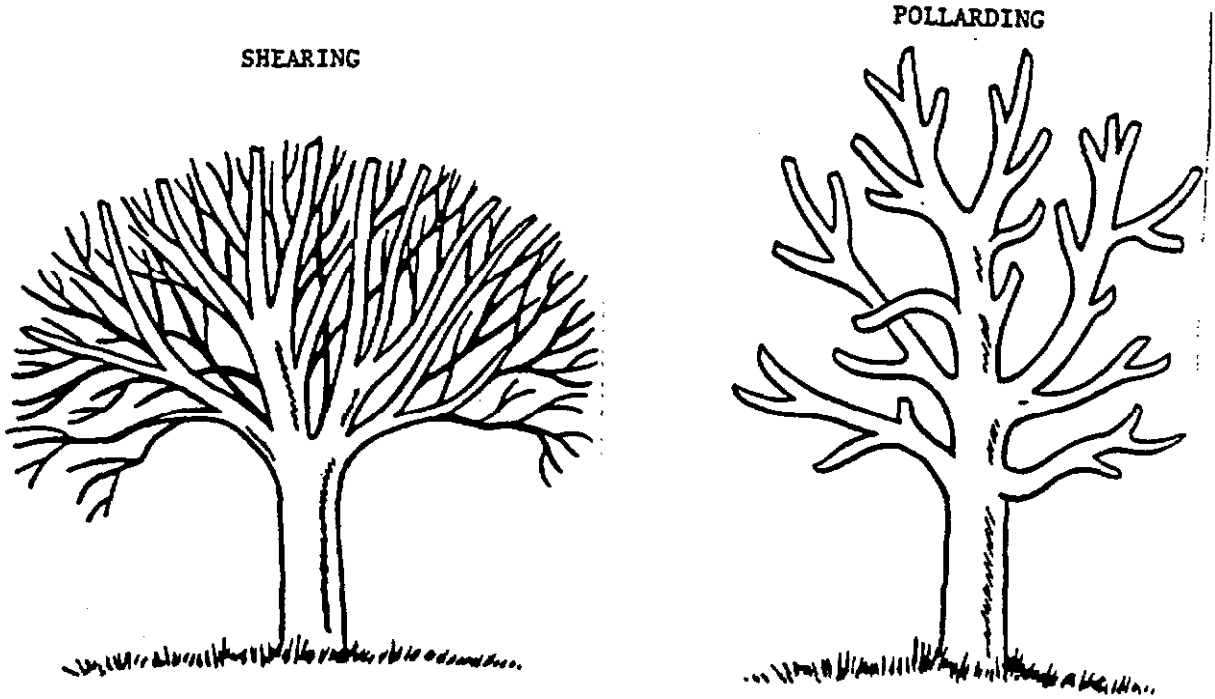
(a) This type of topping is termed drop-crotching, o natural trimming.
(b) More lasting line clearance and better tree appearanc are provided by drop-crotch trimming.

(Fig. III-4)

HEAD-BACK/DROP CROTCH TRIMMING



2.3 Artificial Shape (Fig. III-5)



2.31 Shearing tree crows to uniform conical lines shall not be done. Likewise, pollarding shall not be practiced. (Fig. III-5)

2.32 Crown shearing invites unhealthy tree conditions, may cause rampant regrowth and frequently attracts unfavorable public attention.

3. Removal of Branches

3.1 Dead, Broken, Defective

3.11 Unsound branches that may contact transmission or primary conductors shall be removed.

3.12 Heavy limbs of this type which threaten primary and secondary conductors should be removed.

3.2 Procedure

3.21 Heavy limbs above overhead lines, sidewalks, buildings, or other property shall be removed with extreme care.

(a) Extra precaution shall be taken to make certain that all equipment is adequate.

(b) Supports from which the limb or section will be slung must be sound.

(c) Heavy limbs and tree sections must be under complete control until they have been lowered to the ground.

(d) Cut limbs being removed which may contact a live conductor shall not be touched with any part of the body.

(e) All limbs and stubs shall be directed to the ground to avoid lodging, property damage and injury to the bark and other tree parts.

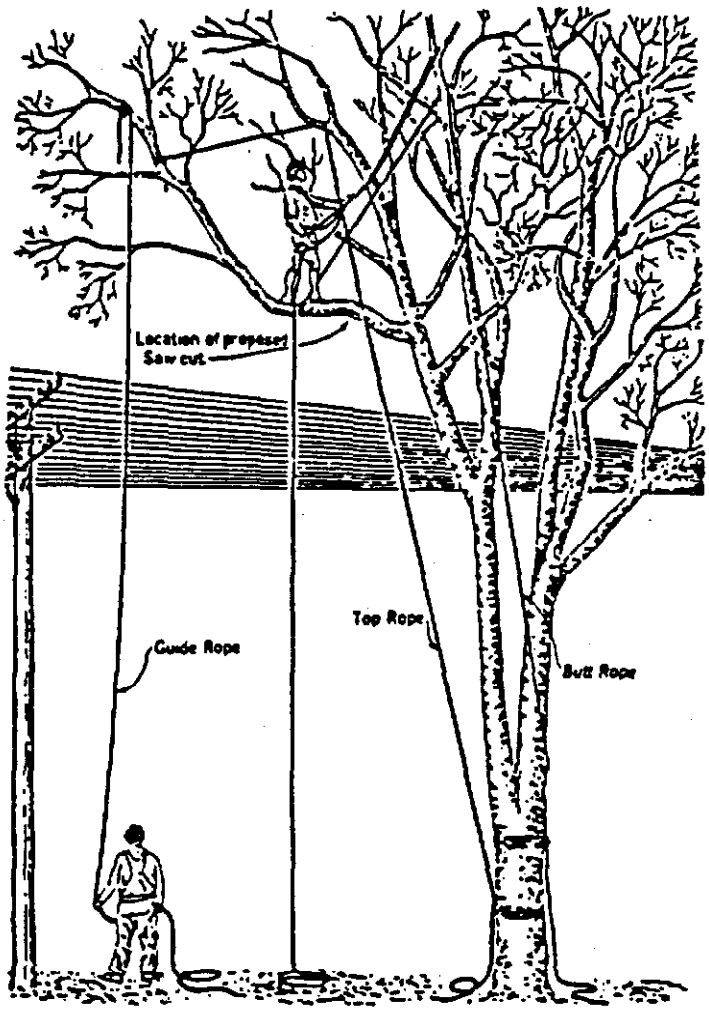
(f) Line clearance trimmers shall look and give clear warning before dropping limbs, branches or stubs from trees.

(g) Line clearance trimmers must never pass between or touch primary conductors, unless such conductors are covered with protective equipment.

(h) Should a branch become lodged on a primary conductor, remove same with dry rope or pole pruners.

3.3 Roping Limbs

The removal of large lateral limbs usually requires roping to prevent the possibility of damage to utility lines or property as well as to prevent the possibility of injury to employees or the public. The method of roping a limb is identical for limbs that are to be lowered, raised or swung to the side. Three ropes are requires to rope a very heavy limb. They are known as Butt Rope, Top Rope and Guide Rope. (Fig. III-6)



(Fig. III-6)

A butt rope of sufficient strength shall be passed through a crotch above the limb or section of snub rope tied around the trunk below the cut. A strong rope shall be used with either a snub rope or stub method and one end of the rope tied securely to the lower end of the limb section which is to be removed. After this is completed, make a final cut on the vertical limb, holding the limb with the hand to permit dropping slowly. Large stubs that are too heavy to hold with the hand shall be held with a rope.

3.4 Top Saw Cut

A top saw cut which is intended to be used whenever conditions permit because it is, in general, the easiest cut to make. Furthermore, the gradual breaking of the wood which occurs with this cut causes less strain on the butt and top ropes and is therefore a safer practice.

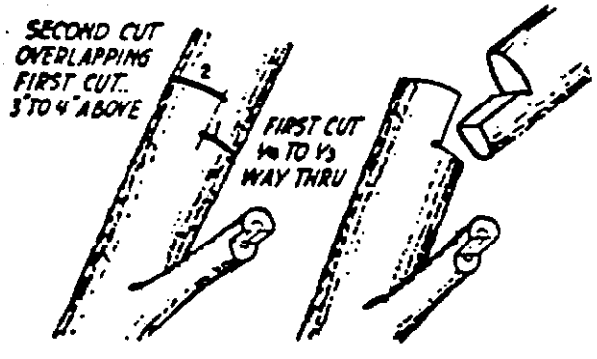
3.5 Bottom Saw Cut

The bottom saw cut is intended to be used where obstructions below make it desirable to raise the limb during the sawing operations, as for example wires that may be very close to the limb.

3.6 Jump Cut (Fig. III-7)

Jump cut is intended for use where the space below is clear and where there is no likelihood of a falling limb damaging property. It consists of two cuts, one made by sawing on the underside of the limb, then the other above and a few inches farther out on the limb. Such cuts should be made a foot or more away from the trunk. Limbs cut in this manner will fall to the ground in approximately the same position in which they were before being cut and usually will 'jump' away from the tree to some extent.

(Fig. III-7)



4. Climbing

Ascending into tree crowns may be done by ladder, climbing rope, arm pull-up, ladder truck, or aerial lift; depending on tree conditions and equipment available. High pull-up rope is permissible; however, it is usually too strenuous for average line clearance trimmers without assistance from a fellow worker. A decayed limb is never safe regardless of natural green wood toughness or limb diameter. All tree foremen and workers should know the comparative strength of various woods as listed in Section II of these standards.

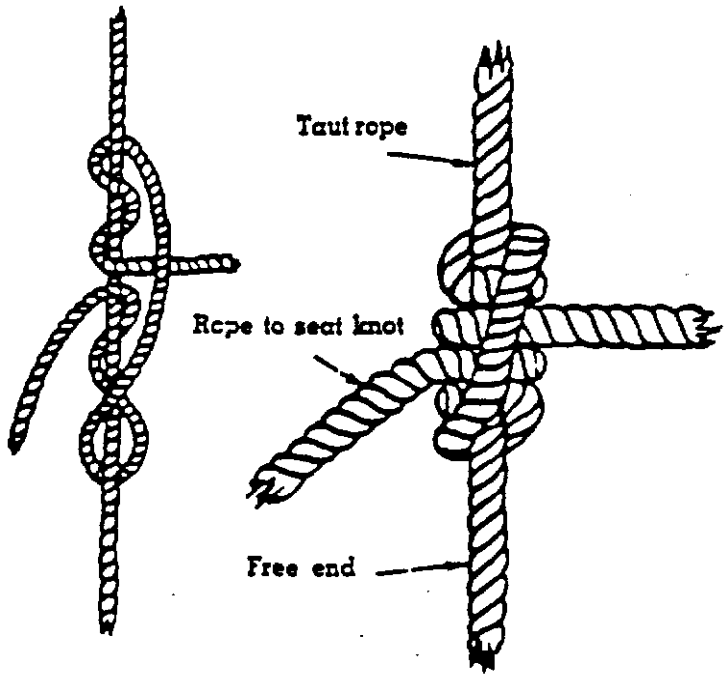
4.1 Climbing With Rope

4.11 Throw climbing line through sturdy crotch.

4.12 Strain on line to determine if crotch will support climber weight.

4.13 Fasten line to saddle, tie taut line hitch (Fig. III-8), and slide hitch up on line as far as it will reach.

(Fig. III-8)



4.14 Climb from limb to limb, or shinning upwards sliding the hitch forward along the standing line.

4.15 Control descent with one hand grasping the hitch, while the other plays out standing line from below.

4.2 Climbing With Ladder

4.21 Ladders shall be climbed with a hand on each side rail.

4.22 Climbing beyond ladder reach should be done with climbing line attached to tree saddle.

4.3 Aerial Lift

This is a motor truck mounted, power-driven, modern machine to lift and position treemen and equipped with power saw and pruner to easily perform tree trimming for line clearance under limited conditions and locations.

(a) Only one line clearance trimmer shall work from bucket position except when using a double bucket or a two-man bucket.

(b) Line clearance trimmers shall maintain safety strap attachment to boom while aloft.

(c) Positive, safe brackets for power and hand tools shall be provided inside the bucket and such equipment shall be secured when not in operation.

(d) When a line clearance trimmer transfers from bucket to a tree crown, climbing line must be crotched and attached to saddle with taut line hitch securely tied before such change in working position.

(e) All tree trimming standards of quality as specified elsewhere in these specifications shall be followed.

(f) Aerial lift booms shall be seated in travel position cradle before motor truck is moved.

4.4 Climbing Spurs (Gaffs)

4.41 Gaffs shall be used only - 1) when engaged in complete tree removal, 2) under extreme declared emergencies, or 3) in remote areas where the following is not a consideration:

(a) Gaffs are not totally reliable and tree bark is sometimes not strong enough to make the use of gaffs safe.

(b) Gaff wounds can promote the entry of damaging tree decay and insects.

(c) Gaff wounds in the bark are objectionable to some property owners.

4.42 In remote areas, gaff use shall be practiced only when clearly necessary and when contributing to greater efficiency and production.

4.43 Gaffs shall be of a proper length to allow safe mobility while ascending and working in the tree.

4.44 Gaffs shall be used only in conjunction with a properly crotched climbing rope.

4.5 Use of Climbing Line

This line is a rope used to secure climbers in trees.

4.51 Before starting to climb, fasten climbing line to saddle rings or place over shoulder with a single bowline.

4.52 The climbing line shall be crotched as soon as practicable after the worker is aloft and then a taut line hitch shall be tied and checked.

4.53 The climber shall never shin a tree for a distance greater than his/her demonstrated physical capabilities and under no circumstances greater than 15 feet (4.55 meters) without the assistance of a climbing rope which has been placed in a wide crotch overhead.

4.54 In trees higher than 50 feet, a figure-eight knot shall be tied in the end of the rope to prevent accidentally pulling the rope through the taut line hitch and causing possible serious injury from a fall.

4.55 Hold long end of line with one hand and place entire body weight on climbing line.

4.56 To regulate working position, place one hand below the hitch on the long end of the line and with the other hand apply pressure to the hitch in the direction desired.

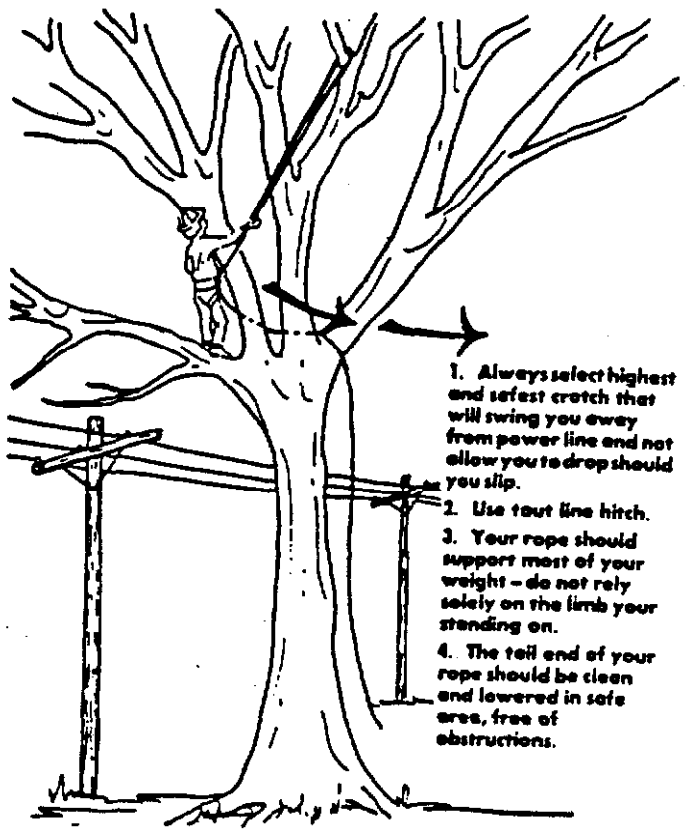
4.57 To hold the line in any position, release the pressure on the hitch and tighten it by throwing body weight gradually into the line while pulling outward on the short end of the rope.

4.58 Work down from the highest position in a tree by the most direct route, keeping the long end of the line hanging free below in the route descent will be made.

4.59 When changing climbing line suspension position in a tree, the climber shall first be secured by recrotching with the long end of the rope or safety strap before releasing the first taut line hitch.

4.6 Tree Saddle

A saddle shall be worn with climbing line attached and properly crotched at all times until the climber has returned to the ground. (Fig. III-9)



(Fig. III-9)

5. Tree Removal

5.1 Conditions Under Which Trees Should Be Removed

Under certain conditions it is desirable, when authorized by the Line Clearance Supervisor to cut down trees rather than to obtain conductor clearance by trimming. The following conditions are examples:

5.11 Trees which have been topped under low level primary and transmission circuits with no future chance for reasonable natural development.

5.12 Trees with dangerously weakened crotches.

5.13 Trees in school yards where children may climb and contact conductors.

5.14 Trees which are too costly to retrim.

5.2 Three Varieties to Consider for Removal

5.21 Fast growing trees with weak, brittle wood such as poplars, willows, ailanthus, Chinese elm, silver maple (soft) and box-elder.

5.22 Short-lived, rapid-growing trees, highly susceptible to insect and disease damage, such as black locust.

5.23 Domestic fruit and nut trees and spindly, weak specimens from which safe clearances cannot be obtained.

5.3 Stripping for Removal

The removal of trees in public places is usually more difficult than on private rights-of-way. Larger than average crowns of shade trees, congested conditions and nearby overhead lines frequently make felling of the entire tree impossible as a single operation. Trees standing on lawns, adjacent to walks, buildings, overhead lines or other improvements should be felled in sections as large as possible to handle safely. The following practice should be followed:

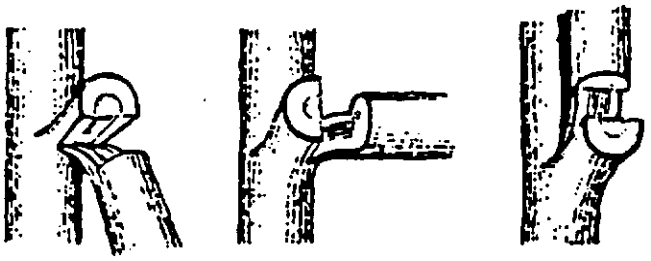
5.31 Ascend tree and crotch climbing line or fasten safety strap in best central working position.

5.32 Remove limbs in such order that each has a free space to fall or to be lowered with rope. This may require removing limbs first from the lower crown.

5.33 Lower with rope all limbs that might, in falling, cause property damage or injury to persons.

5.34 Types of saw cuts best suited to the job at hand shall be used in removing limb and trunk sections. (Fig. III-10)

(Fig. III-10)



5.35 A jump cut without rope may be used only when there is no danger to property or person.

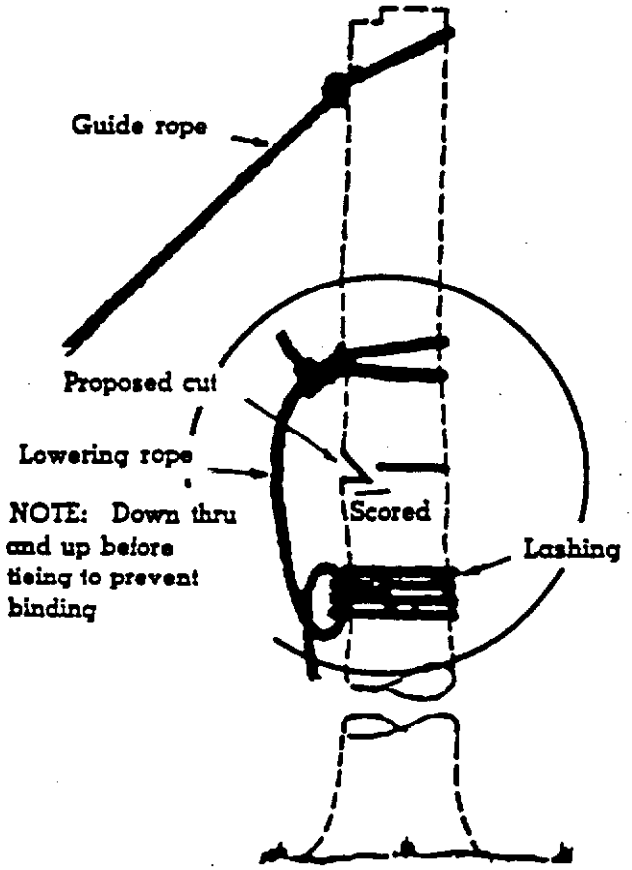
5.36 Suitable knots and hitches shall be used in securing limbs for removal.

5.37 All ropes shall be kept coiled or otherwise carefully laid out so they will be free-running at all times.

5.38 Brush and other objects shall be out of the way to prevent fouling of ropes in service.

5.39 Where heavy, bare trunk sections must be lowered with rope be certain all tackle used is adequate in strength and properly applied.

The lower 10-20 feet of trunk may be dropped in one piece. (Fig. III-11)



(Fig. III-11)

5.40 In felling heavy tree trunks, all exposed walks, roadways and lawns should be protected with a cribbing of large branches to avoid damage.

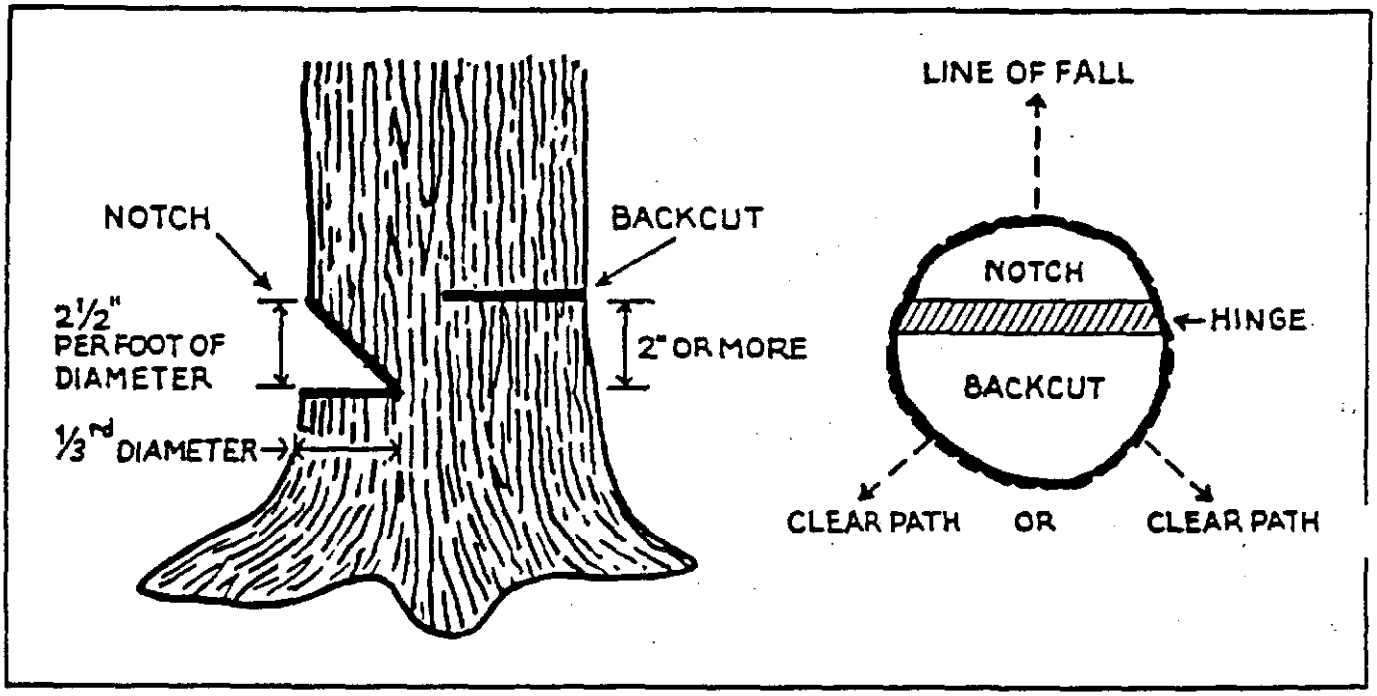
5.4 Felling Without Stripping

5.41 Trees may be felled in one piece where overhead lines, private property and traffic are not endangered.

5.42 Trees felled adjacent to power lines shall have adequate work lines attached and securely anchored in the direction of fall.

5.43 Butt-rotted trees and trees with heavy lean against the direction of fall shall be securely anchored with suitable rope or cable to insure felling in a safe direction.

5.44 To control direction of fall, all trees should be butt notched before felling. (Fig. III.12)



(Fig. III-12)

5.5 Hazardous Situations

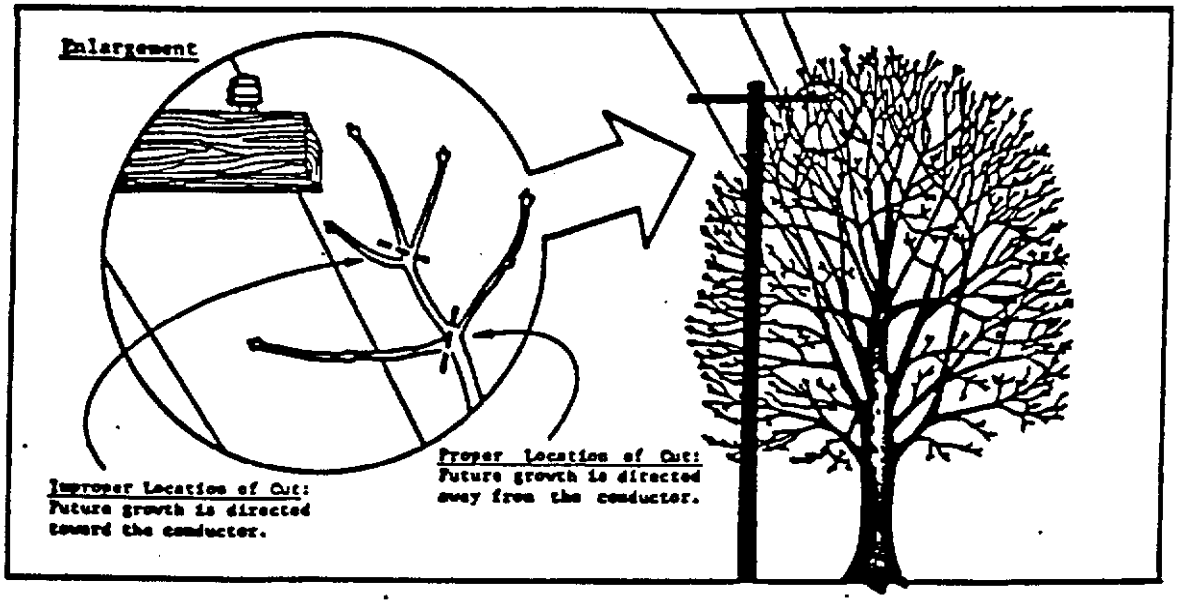
5.51 Where a severe overhead line hazard exists that cannot be handled by standard job methods, the line clearance supervisor shall be contacted to de-energize the line or provide other protective measures.

5.6 Stumps and Stump Removal

5.61 All stumps on lawns, parkways, streets and highways shall be cut as flush with the groundline as possible, except where otherwise directed.

5.62 Stumps on private rights-of-way shall be cut as low as practicable.

6. Natural Trimming (Fig. III-13)



Natural Trimming (to direct growth away from wires)

(Fig. III-13)

Natural trimming is a method by which branches are cut flush at a suitable parent limb back toward the center of the tree. This method of trimming is sometimes called "drop-crotching" or lateral trimming. Large branches should be removed to laterals at least one-third the diameter of the branch being removed. Natural trimming is especially suitable for the topping of large trees where a great deal of wood must be removed. In natural trimming, almost all cuts are made with a saw with very little pole pruning work required. This results in a natural looking tree, even if a large amount of wood has been removed.

Natural trimming is also directional trimming, since it tends to guide tree growth away from the wires. Stubbing or pole-clip clearance, on the other hand, tends to promote rapid sucker growth right back into the conductors. The big factor to remember is that natural clearance does work, and with two or three trimming cycles done in this manner, an ideal situation for both the utility and the tree owner will result. Most shade trees lend themselves easily to this type of trimming.

The natural trimming technique should be used for topping, side trimming, under trimming, and combinations as described on the following pages.